TECHNICAL DESCRIPTION

PRINT MEDIA TECHNOLOGY

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world **skills**
international

WorldSkills International, by a resolution of the Technical Committee and in accordance with the Constitution, the Standing Orders and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

Effective 11.10.11

John Shiel
Chair Technical Committee

Stefan Praschl
Vice Chair Technical Committee

1.   INTRODUCTION

1.1   Name and description of skill

1.1.1   The name of the skill

Print Media Technology.

1.1.2   Description of skill

Print Media Technology involves the production of printed material using an offset sheet-fed press, digital press, and other equipment to create finished, printed products. Print Media Technicians are responsible for producing all printed material in a printing business.

The skill requires an in-depth knowledge of handling, troubleshooting and maintaining print factors such as ink, paper, mechanical and digital equipment. Generally, production of the printed product will use a traditional ink-on-paper process, but increasingly operators are using toner-on-paper technology for shorter runs and variable data.

Operators also have to be able to mix custom ink colours, operate finishing equipment to produce a job to a customer's specifications. Digital files must be saved in proper formats to assure seamless workflow through the process. Quality and process control equipment is used to verify and adjust the quality of printed products and the print media process.

1.2   Scope of application

1.2.1   Every Expert and Competitor must know this Technical Description.

1.2.2   In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3   Associated documents

1.3.1   As this Technical Description contains only skill-specific information it must be used in association with the following:
- WSI - Competition Rules
- WSI - Online resources as indicated in this document
- Host Country - Health and Safety regulations

2.   COMPETENCY AND SCOPE OF WORK

The Competition is a demonstration and assessment of the competencies associated with this skill. The Test Project consists of practical work only.

2.1   Competency specification

General
Competitors shall know and understand:
- The process with different environmental factors influencing the Offset Printing process.
- The characteristics of the Offset Printing, toner based and ink-jet digital materials– paper, inks, dampening solution, toners, proofing material – and their interaction. Knowledge of the correct handling of chemicals and cleaning agents is also needed.
- The theory of colours to be able to adequately interpret the colour imprint on the printed sheet during make-ready and production, and to translate this into appropriate action on the press.

Press Run
Competitors shall be able to:
- Print a specified amount of printed products on the sheet-fed offset press according to the quality and technical criteria set and accepted by a customer and according to standards in the industry.
- Perform make-ready, operation and adjustments on multi-colour sheet-fed offset press with or without remote control consoles.
- Use presses with either semi-automatic or automatic plate mounting.

Cleanup
Competitors shall be able to:
- Clean the equipment and premises after the offset, digital, and finishing printing process
- Cleaning must be done in a specified time
- Cleaning must be done to specified standards

Finishing
Competitors shall be able to:
- Finish the printed work by trimming it with a paper cutter to specified dimensions
- Use a programmable paper cutter
- Use a simple folding machine
- Use a simple stitcher or perfect binding machine

Other Related Skills
Competitors shall be able to:
- Solve the problems in the SHOTS print simulation program. Understand the financial and virtual time reporting functions of SHOTS. The actual version of the SHOTS program that is available 6 months before the Competition is to be the version in the Competition.
- Use the SHOTS print simulation program in one of the official languages (English, French or German) or when available, in the Competitor's chosen language.
- Operate a digital printing press - toner and/or inkjet.
- Use digital printing press RIP Software (Raster Image Processor) for file set-up operations like; checking/creating, imposition and colour management.
- Use variable data software to be specified one year before the Competition for digital printing
- Demonstrate knowledge & management of offset & digital printing materials – paper, ink, toner
- Operate measuring and quality control devices.
- Use different measuring devices like densitometer, spectrophotometer, micrometer, calliper, ph, conductivity, etc.
- Demonstrate an understanding of safety and environmental regulations.
- Perform common maintenance activities on offset presses and finishing equipment
- Plate making and image quality verification

Safety and environmental regulations
Competitors shall know and understand:
- How to work in a safe manner throughout the process
- The using of adequate protective devices and materials
- How to maintain cleanliness
- The handling of chemicals and waste material in an appropriate way.

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**2.2	Theoretical knowledge**

2.2.1	Theoretical knowledge is required but not tested explicitly.

2.2.2	Knowledge of rules and regulations is not examined.

**2.3	Practical work**

- Offset Printing a specified number of different printed products on the sheet-fed offset presses according to the quality and technical criteria set and accepted by a customer and known as standards in the industries, for example ISO 12647-2.
- Produce digitally a specified number of different products on a digital press according to standards identified by Experts on the Discussion Forum.
- Printing must be done in a specified time
- Finishing the printed work by trimming, folding, and binding it with a paper cutter, folder, and simple binding machine to specified dimensions
- Controlling the quality throughout the production process and carrying out required quality measurements and reporting tasks
- Cleaning the equipment and the premises after the Offset Printing, digital printing, finishing and maintenance process
- Cleaning must be done in a specified time
- Print different jobs with a print simulation program within a specified time and/or cost.

# 3.	THE TEST PROJECT

**3.1	Format / structure of the Test Project**

The format of the Test Project is a series of standalone modules.

The modules consist of at least one live print job and some simulated print jobs

**3.2	Test Project design requirements**

The Test Project modules must be designed it tests the Competitors' skills in printing according to the general requirements in the printing industry. The key areas of competence are:
- Meeting the quality requirement
- Completing the jobs in time
- Avoiding excessive waste
- Handling the equipment and the materials in a professional way
- Observing the safety and environmental regulations

The structure of the Test Project modules depend on (a) quantity and type of equipment supplied by the Competition Organiser, (b) the number of participating Members. The modules must be designed with those limitations in mind.

The Test Project consists of offset print jobs, 1 or more digital print job, and some additional tasks. Print jobs should be different from each other in terms of product type, paper grade and print run. Additional tasks should be connected to the print jobs. The Competition timetable specifies the order and timing of the different tasks over the four Competition days.

If it is practically possible, the last of the print jobs could be a product designed earlier at the Competition by Competitor(s) of Skill 40 Graphic Design Technology.

Specification of the Test Project

- The specification for the Test Project modules will be developed within 12 months of the Competition on the Discussion Forum.
- Number of colours: 4 colours and/or mixed spot colours
- Offset printing plates will be supplied or made by the Competitor
- Paper for modules will be supplied either cut to printing size or the Competitor may need to trim the feedstock
- Number of copies to be produced for each module will range from 50 – 5000
- Up to 6 kinds of paper may be specified
- Quality target for printing jobs: Approved Proof, (later called AP offset-printed sheet) approved by customer (which can be either Experts or Competitors), a specified numerical density and/or LAB targets, specified time and costs (for the print simulator)
- Experts will agree on the forum which industry standards will be used for evaluation reference. i.e., ISO, GRaCOL, Pantone, etc
- Experts may be asked to provide printed sheets with known defects, digital files with known defect that will later be used if indicated in the test project.

Make ready according to the job ticket (also for print simulator jobs- and digital press)
Instructions to Competitors are provided in the form of a job ticket. The job ticket is finalised after the number of Competitors and presses are known.

- Loading the paper sheets, filling the ink ducts
- Mounting the Offset-Printing plates
- Adjusting the feeder, sheet transfer and delivery
- Adjusting Offset-Printing pressure
- Mixing necessary (PMS) ink colours
- Adjusting ink feed and ink profiles
- Adjusting colour register
- Producing proof prints, comparing them to the specified targets and making necessary adjustments.
- Make ready is completed when the Competitor produces an OK sheet which corresponds to the AP visually, or the solid ink densities are within specified tolerances of the appropriate ISO standards

Offset-Printing and digital printing according to the job ticket (also for print simulator jobs)

- Operating the press to produce the required number of copies within the quality tolerances and specified time
- Making adequate quality assessments and measurements and adjusting the press accordingly
- Making additional adjustments to the press as required.
- Cleaning the Printing press and carrying out basic maintenance work
- Set back the adjustments of the printing equipment to zero

Finishing according to the job tickets (also for print simulator jobs)

- Preparing a cutting plan and programming the paper cutter
- Cutting the printed product(s) to the required dimensions
- Fold and bind printed products according to specifications

Quality control and adjustments (also for print simulator jobs)

- Checking the quality of materials, the correct operation of the press and the quality of the print throughout make ready and Offset-Printing
- Maintaining correct colour registration and correct density during the whole process
- Checking the mixed colours with spectrophotometer
- Checking the accuracy of trimming
- Checking the number of good copies and waste
- Measuring density of the four colours LAB values of pantone colours, of the saved sheets from specified jobs.

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3.3 Test Project development

The Test Project MUST be submitted using the templates provided by WorldSkills International (http://www.worldskills.org/competitionpreparation). Use the Word template for text documents and DWG template for drawings.

Time	Activity
12 months prior to the Competition	The specifications of the Test Project are developed on the Discussion Forum. The sponsor/supplier prepares the technical realisation of the Test Project.
6 months prior to the Competition	The Test Project modules are submitted to the Technical Director for circulation on the WSI website.
3 months prior to the Competition	Final parts and changes to the Test Project are circulated on the WSI website.
At the Competition	The 30% change is selected from proposals and discussion on the forum prior to the Competition.

3.3.1   Who develops the Test Project / modules
The Test Project / modules are developed by:

By different groups of Experts on the Discussion Forum

A design team is open to any Member to provide suggestions.

3.3.2   How and where is the Test Project / modules developed

Independently by an Expert team on the forum prior to the Competition and presented by one Expert.

Following the selection of a Test Project module for the next Competition, the Expert who prepared the chosen module will prepare the detailed marking scheme (Subjective and Objective Marking Forms), with assistance from other Experts where necessary. It will be submitted to the Technical Director 6 months prior to the Competition.

3.3.3   When is the Test Project developed
The Test Project is developed:

12 months before the Competition when the Infrastructure List and the Competitor registrations are known.

The sponsor/supplier providing the press equipment will prepare the technical realisation of the Test Project.

3.4 Test Project marking scheme

Each Test Project must be accompanied by a marking scheme proposal based on the assessment criteria defined in Section 5.

3.4.1   The marking scheme proposal is developed by the person(s) developing the Test Project. The detailed and final marking scheme is developed and agreed by all Experts at the Competition.

3.4.2   Marking schemes should be entered into the CIS prior to the Competition.

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3.5 Test Project validation

The Chief Expert will be responsible for ensuring that the Test Project modules can be completed within the constraints of the Competition. These include time, expected skill-level of the Competitors, and materials and equipment provided. The Chief Expert will also ensure that there are no installation requirements that cannot be completed.

3.6 Test Project selection
The Test Project is selected as follows:

By vote of Experts on the forum

3.7 Test Project circulation
The Test Project is circulated via WorldSkills International website as follows:

- The Test Project is circulated six months before the Competition.
- The final parts of the Test Project – including appropriate changes – will be provided to participating Members at least three months prior to the WorldSkills Competition.

The Expert will develop the final version of the Test Project on the Discussion Forum. In concept it is ready, but in detail (like printing form and amount colours) will be done by technicians of the press equipment sponsor/supplier.

After this development it is discussed with all Experts.

12 months before the Competition the number of presses is confirmed and final decisions about the Test Project can be made. Also the final assessment criteria will be discussed – refer to paragraph 5.3.

3.8 Test Project coordination (preparation for Competition)
Coordination of the Test Project will be undertaken by:

Experts
- The likely number of participating Members will be known 12 months before the Competition.
- The actual equipment set-up supplied by the Host Member should be known 12 months before the Competition.
- When the above are known, planning of the structure and timing of the Test Project can be started in the Discussion Forum.

The Chief Expert will be responsible for ensuring that:
- There are no installation requirements that can not be completed
- The modules can be completed in Competition time
- The Competitor instructions are kept to a minimum of text and that they do not exceed the available space permitted on the approved instruction sheet for any one module
- The Test Project modules are complete in all aspects. This part of the preparation must be completed six (6) months prior to the WorldSkills Competition.
- All required communication occurs between all Experts and participating Members.
- Any FAQ (Frequently Asked Questions) document/email is developed in the months leading up to the Competition and posted on the Discussion Forum to ensure that the same answers are provided to everyone and that no Member has an unfair advantage.

3.9 Test Project change at the Competition

Additional print modules and tasks can be put forward up to the Competition time, and changes to one or more of the print jobs included in the Test Project can be made prior to the start of the Competition (the 30% rule).

- Experts will present proposals on the forum.
- Different groups of Experts will be created by the Chief Expert to develop the various tasks.
- A concrete proposal for this will be developed 6 months before the Competition.

The parts of the modules that can be changed are as follows:
- The actual printed images (provided that fast CTP plate-making services are available in the Host country/region)
- Print runs, paper sizes, Pantone ink specifications (within the limitation of the infrastructure list)
- The parts of the modules that should not be changed are:
- Paper grades (predetermined in infrastructure list)
- Number of colours in each module (limited by press type and ink supply as per infrastructure list)
- The additional tasks connected to a job.

3.10   Material or manufacturer specifications

Not applicable

4.   SKILL MANAGEMENT AND COMMUNICATION

4.1   Discussion Forum
Prior to the Competition, all discussion, communication, collaboration and decision making regarding the skill must take place on the skill-specific Discussion Forum (http://www.worldskills.org/forums). All skill-related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be moderator for this forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

4.2   Competitor information
All information for registered Competitors is available from the Competitor Centre (http://www.worldskills.org/competitorcentre).

This information includes:
- Competition Rules
- Technical Descriptions
- Test Projects
- Other Competition-related information

4.3   Test Projects
Circulated Test Projects will be available from worldskills.org (http://www.worldskills.org/testprojects) and the Competitor Centre (http://www.worldskills.org/competitorcentre).

4.4   Day-to-day management
The day-to-day management is defined in the Skill Management Plan that is created by the Skill Management Team led by the Chief Expert. The Skill Management Team comprises the Jury President, Chief Expert and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalised at the Competition by agreement of the Experts. The Skill Management Plan can be viewed in the Expert Centre (http://www.worldskills.org/expertcentre).

5. ASSESSMENT

This section describes how the Experts will assess the Test Project / modules. It also specifies the assessment specifications and procedures and requirements for marking.

5.1 Assessment criteria

This section defines the assessment criteria and the number of marks (subjective and objective) awarded. The total number of marks for all assessment criteria must be 100.

Section	Criterion	Marks		
		Subjective (if applicable)	Objective	Total
A	Offset Printing		60	60
B	Digital Printing		10	10
C	Maintenance		10	10
D	Additional tasks		20	20
	Total =		100	100

5.2 Subjective marking

Not applicable

5.3 Skill assessment specification

A – Offset Printing
- Processing and control of the printing materials
- Print ready operations (set-up) for printing press
- Making the OK sheet
- Colour registration
- Number of copies
- Colour quality and measuring
- Cleaning operations
- Colour Measurement
- Time Management
- Print Finishing operations
- Cleanliness of the working area

B – Digital Printing
- Control of the printing process
- Control of the quality of the printed matter
- Imposition
- Time Management
- Print Finishing operations
- Printable file checking and managing operations
- Variable data printing

C - Maintenance
- Time Management
- Producing printing solution and water analysis, like conductivity, alcohol and pH
- Printing blanket measuring and changing operations
- Roller and bearing dimensions measuring and analysis
- Roller and bearing assembly operations
- Service and maintenance actions for offset printing machine
- Measuring activities
- Producing Offset printing water and analysis
- Adjusting and setting rollers to the machine

<u>D – Additional Tasks</u>
- Ink mixing
- Time management
- Identification of printed defects
- Digital file management (pre-flight)
- Print Simulation
- Plate making and measuring
- Print quality issues
- Print finishing operations
- Extra tasks for Offset printing module(A)
- Extra tasks for Digital printing module (B)
- Extra tasks for Maintenance module (C)

5.4   Skill assessment procedures

- The marking scale must be developed on the Discussion Forum. This will give the final assessment marks.
- Ensure the number of aspects of criterion is a maximum of 65 in line with the Competition Rules.
- Progressive marking will be used for all sections of the Competition, with daily marking of completed modules and data entry into the CIS.
- Experts are divided into marking teams at the Competition by the Chief Expert. WorldSkills experience, language, culture and continent Member is from are taken into consideration.
- All Experts mark the same aspects for all Competitors.
- All Experts mark the same percentage of marks where possible for the Competition.
- During the Competition three (3) Experts observe one Competitor and write down their marks. Following consensus between the Experts marks will be entered into the CIS.
- After the Competitor has completed the individual modules, Experts will look at the printed jobs and there will be a "blind" marking for each job. Following consensus between the Experts marks will be entered into the CIS.
- For the objective marking, all aspects will be assessed at the same time at the end of each Competition day.
- Once the Test Project is established it will be tested on the Competition site (if possible) so the Experts can test the marking scheme and establish acceptable measurement standards and tolerances.

6.   <u>SKILL-SPECIFIC SAFETY REQUIREMENTS</u>

Refer to Host Country Health & Safety documentation for Host Country regulations.

- Long hair must be tied up or covered.
- Jewellery or other hanging objects in clothing is forbidden.
- Work clothing must be a kind of which presents no danger or snagging.
- Work shoes must allow safe working and movement
- Competitors must follow the provided instructions of the machines
- Competitors must follow the provided instructions on the handling of detergents, printing ink and paper.

7. MATERIALS & EQUIPMENT

7.1 Infrastructure List
The Infrastructure List details all equipment, materials and facilities provided by the Host Country.

The Infrastructure List is online (http://www.worldskills.org/infrastructure/).

The Infrastructure List specifies the items & quantities requested by the Experts for the next Competition. The Competition Organiser will progressively update the Infrastructure List specifying the actual quantity, type, brand/model of the items. Competition Organiser supplied items are shown in a separate column.

At each Competition, the Experts must review and update the Infrastructure List in preparation for the next Competition. Experts must advise the Technical Director of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

7.2 Materials, equipment and tools supplied by Competitors in their toolbox

- Working clothes
- Gloves and earplugs are supplied by the Competition Organiser

7.3 Materials, equipment and tools supplied by Experts

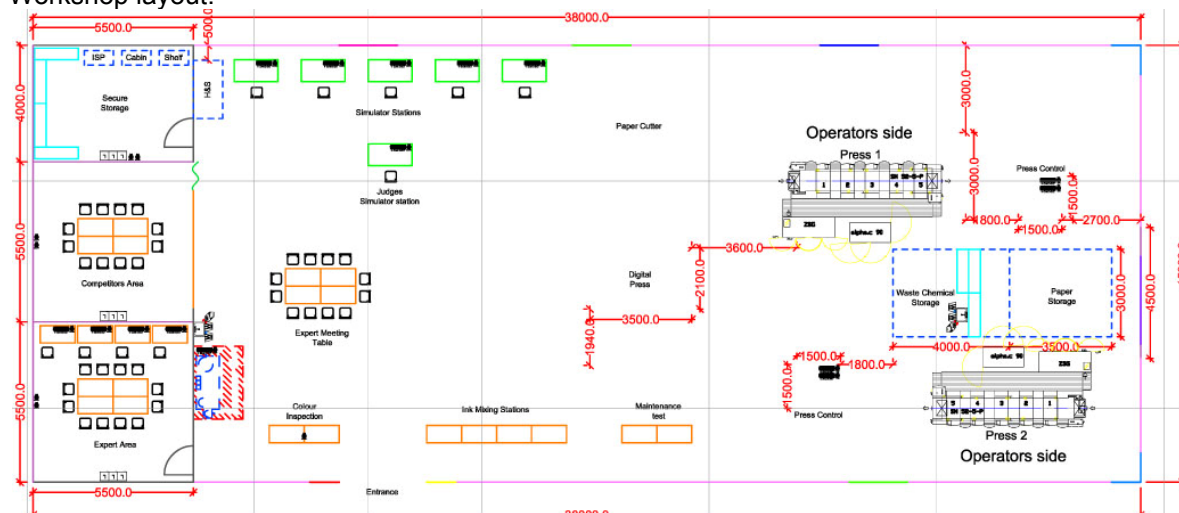All equipment required will be supplied by the Competition Organiser

7.4 Materials & equipment prohibited in the skill area

Tool boxes are not allowed

7.5 Proposed workshop and workstation layouts

Workshop layouts from London are available at:
http://www.worldskills.org/index.php?option=com_halls&Itemid=540

Workshop layout:

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8. MARKETING THE SKILL TO VISITORS AND MEDIA

8.1 Maximising visitor and media engagement

To maximise visitor and media engagement the following ideas may be considered:
- Presses should be installed in a way to make it attractive for spectators.
- Try a trade
- Display screens
- Test Project descriptions
- Enhanced understanding of Competitor activity
- Competitor profiles
- Career opportunities
- Daily reporting of competition status

8.2 Sustainability

- Recycling
- Use of 'green' and environmental friendly materials
- Use of completed Test Projects after Competition
- Printed copies will be supplied to a not-for-profit organisation

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